OP. 3100. 128. 14

MINISTRY OF DEFENCE

Report of a Working Party on the transport of nerve agents from Nancekuke to Porton and the disposal of effluent from nerve agent production

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REPORT OF A WORKING PARTY ON THE TRANSPORT OF NERVE AGENTS FROM NANCEKUKE TO PORTON AND THE DISPOSAL OF EFFLUENT FROM NERVE AGENT PRODUCTION

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Mr. P. A. Sansom, Ministry of Defence (*Secretary*).

1. The Working Party was set up on 23 September 1969 to advise on the potential hazards arising from

- (*a*) the transport of nerve agents by road from Nancekuke to Porton
- (*b*) the disposal of effluent from a nerve gas production facility if it were located at Porton instead of Nancekuke.

We were subsequently invited to advise on the safety of the effluent disposal system currently in use at Nancekuke.

2. We held our first meeting at CDE, Porton Down, on 25 November 1969, and our second at CDE, Nancekuke, on 7 January 1970.

3. At the first meeting we

- (*a*) examined in detail the present authorised method of transport and its safety, based on the sub-division of a vehicle load into one-litre elements each in its own separate packaging system
- (*b*) inspected the three containers forming a package (as shown in the attached photograph) and noted that the special materials surrounding the inner containers were adequate to take up the total quantity of nerve agent. We also examined a typical vehicle used for transport.
- (*c*) were given details of the tests to which the packages are subjected and saw some typical results.

We were also given additional information by the directing staff responsible for the safety of the whole operation.

4. In the light of our discussions we reached the following conclusions:—

- (*a*) The conveyance of nerve agents from Nancekuke is carried out in a thoroughly responsible manner and there are no objections on safety grounds to the conveyance under the present CDE regulations of further consignments of nerve agents should they be needed in the future.
- (*b*) Although the current regulations permit the presence of more than one agent-carrying vehicle per convoy, we have concluded that, in view of the small amount of agent involved, there should be no more than one such vehicle per convoy. It should be followed, as present regulations require, by a second vehicle carrying the officer-in-charge and other accompanying personnel. As at present this second vehicle should also carry personal protective equipment; decontamination, fire-fighting and first-aid kits. The convoy should be escorted throughout its journey by a police patrol, but we appreciate that, under exceptional circumstances, this might not be practicable. The advisability of having a medical officer accompanying a convoy was discussed at great length. We concluded that as the method of transport is essentially safe the presence of a Medical Officer was not mandatory.
- (*c*) The amount of agent to be carried in the single vehicle mentioned above should not exceed 30 litres (approximately 60 lb).
- (*d*) There are certain minor technical improvements to the equipment, such as the incorporation of a sintered metal plug into the lid of the middle container, which we have proposed and which CDE have accepted, in order to improve the safety margins still further.

(*e*) We have considered the potential consequences of a major fire such as might result for example from a collision involving a petrol tanker. The Fire Research Station has estimated that the exposure of the three-container system to such a fire for one hour would result in the temperature of the middle container rising to about 100° C. We conclude therefore that the rise in temperature of the inner container carrying the agent would not contribute to any overall hazard. Neverthless we recommend that the agent-carrying vehicle should comply with the requirement laid down in Statutory Instrument 1969 No 20 (The Conveyance by Road of Military Explosives).

(*f*) The present equipment used and the regulations under which it is operated provide an extremely high standard of safety under all foreseeable eventualities.

5. We considered the hazards which might arise from the transport of nerve agents in comparison with those which could arise from present commercial practice in conveyance by road of liquid toxic chemicals. We were unable to make a quantitative assessment on account of the special safety conditions applying to the transport of nerve agents ie

(*a*) The load is sub-divided into small elements each in a metal flask

(*b*) each flask is heavily protected against impact damage and surrounded by sufficient absorbent material to take up the whole amount of agent

(*c*) the carrying vehicle is normally under police escort.

We are in no doubt, however, that the manner in which nerve agents have been transported or may be transported in future is very much safer than is found in general practice in the chemical industry, which already insists on high standards and has a very good safety record. Moreover, this comparison does not take into account the infrequency of nerve agent convoys compared with the large numbers of commercial tankers on the roads each day.

6. On examining the effluent disposal system at Nancekuke we noted that

(*a*) each laboratory or production unit has its own holding tank where the contents can be treated and tested before going into the site drainage system

(*b*) the process heating and cooling systems function in closed circuits so that no effluent fluids are produced

(*c*) any accidental spillage which occurs can be contained and treated individually

(*d*) all liquid effluent is collected in the main effluent tank where massive dilution occurs and where, in the event of an accident, the main outfall overflow can be closed; in addition there is a further 10,000 gallon overflow capacity

(*e*) all gaseous effluent is passed through appropriate absorption equipment to remove toxic materials before emission into the air

(*f*) both gaseous and liquid effluents are sampled, analysed and appropriately treated before release

(*g*) the toxicities of any chemicals arising from CDE, Nancekuke, have been determined with respect to small fish, molluscs and prawns indigenous to the area, and the final effluent is tested against these species before it is disposed of.

7. Following our discussions we concluded that

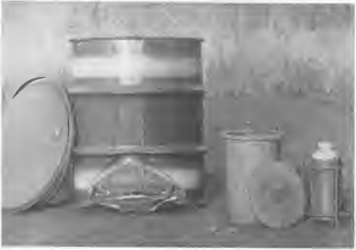
(*a*) the effluent system at CDE, Nancekuke, is entirely satisfactory to treat effluents arising from all foreseeable eventualities and embraces safeguards not common to normal practice (*b*) the effluent from CDE, Nancekuke, causes negligible pollution of the sea or of the atmosphere.

8. We dicussed the problems and potential hazards arising from a nerve gas production facility if it were located at CDE, Porton. We concluded that in view of our assessment of the safety of the system for transport of nerve agents there was no need to investigate further the problem of effluent disposal at Porton.

9. In concluding this report we wish to express our thanks to our Secretary, Mr P A Sansom, to Mr L W J Warner, Superintendent, Process Research Division, and to all members of the staff of CDE, Porton, and Nancekuke, who gave evidence and who demonstrated the practices at present employed in regard both to the transport of nerve agents and to the disposal of effluent.

PRINTED IN ENGLAND FOR HER MAJESTY'S STATIONERY OFFICE
BY THE OYEZ PRESS
PRINT DIVISION OF THE SOLICITORS' LAW STATIONERY SOCIETY, LIMITED

Dd. 501072 K24 1970



Package for nerve agent transport from Nancekuke.

Left —Outer container
(showing how the shock caused by the standard test, involving a 40 ft. drop on to concrete, is wholly absorbed by the outer container).

Centre—Inner steel container.

Right —Inner aluminium bottle.

UNIV. CAMBRIDGE 22 AU 1970

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